IN THE CORONERS COURT
OF VICTORIA
AT MELBOURNE

COR 2020 002747

FINDING INTO DEATH WITHOUT INQUEST

Form 38 Rule 63(2)

*Section 67 of the **Coroners Act 2008***

Findings of:	Coroner Sarah Gebert
Deceased:	Mr L [1]
Date of birth:	[redacted] 1984
Date of death:	23 May 2020
Cause of death:	*Thermal Injuries Sustained in a Fire*
Place of death:	The Alfred Hospital, 55 Commercial Road, Melbourne, Victoria
Keywords:	*Wood Fire Heater; Coonara*

1. This finding has been de-identified by order of Coroner Sarah Gebert to replace the names of the deceased, his family members and select individuals with pseudonyms to protect their identity and redact identifying information

INTRODUCTION

1. Mr L,[1] born [redacted] 1984, was 35 years old at the time of his death.

2. Mr L is survived by his fiancée Ms S ([redacted]), their three children, and his parents. At the time of his death, Mr L lived on [redacted] in Cranbourne West ([redacted]) with Ms S and their children [redacted], [redacted] and [redacted].

3. Mr L was a carpenter and was known by his friends and family to be a *very talented handyman*. He had built several items for the family home and loved to spend time in the garage working on projects.

4. On 23 May 2020, Mr L died at the Alfred Hospital from thermal injuries sustained in a fire at his home.

THE CORONIAL INVESTIGATION

5. Mr L's death was reported to the Coroner as it fell within the definition of a reportable death in the *Coroners Act 2008* (Vic) (**the Act**). Reportable deaths include deaths that are unexpected, unnatural or violent or result from accident or injury.

6. The role of a coroner is to independently investigate reportable deaths to establish, if possible, identity, medical cause of death, and surrounding circumstances. Surrounding circumstances are limited to events which are sufficiently proximate and causally related to the death. The purpose of a coronial investigation is to establish the facts, not to cast blame or determine criminal or civil liability.

7. Under the Act, coroners also have the important functions of helping to prevent deaths and promoting public health and safety and the administration of justice through the making of comments or recommendations in appropriate cases about any matter connected to the death under investigation.

8. Victoria Police assigned Senior Constable Matthew Wilkins (**SC Wilkins**) to be the Coroner's Investigator for the investigation of Mr L's death. SC Wilkins conducted inquiries on my behalf, including taking statements from witnesses and compiling a coronial brief of evidence.

[1] Referred to in my finding as '[redacted]' unless more formality is required.

The coronial brief contains statements family, friends, the forensic pathologist, as well as the Country Fire Authority (**CFA**) Investigation Report and other relevant documentation.

9. A joint investigation into the origin and cause of the fire was conducted by CFA, Victoria Police Forensic Services Centre (**VPFSC**) and the Victoria Police Arson and Explosives Squad.

10. This finding draws on the totality of the coronial investigation into Mr L's death including evidence contained in the coronial brief. Whilst I have reviewed all the material, I will only refer to that which is directly relevant to my findings or necessary for narrative clarity. In the coronial jurisdiction, facts must be established on the balance of probabilities.[2]

MATTERS IN RELATION TO WHICH A FINDING MUST, IF POSSIBLE, BE MADE

Circumstances in which the death occurred

11. Approximately four years prior his death, Mr L purchased a wood-fired Coonara heater for the garage at the [redacted] address which was installed professionally. Mr L subsequently modified the Coonara heater to run on oil rather than wood. Ms S said that Mr L was proud of his work, and she was unaware of any issues relating to the modification.[3]

12. The evidence suggests that the modification functioned through the use of an oil drip gravity system whereby an oil reservoir (a 20L plastic tank) was connected to the heater through a copper pipe. The flow of oil was controlled by a tap at the end of the copper pipe attached to the heater.[4]

13. In the afternoon of 22 May 2020, [redacted] and [redacted] (Mr L's father and uncle respectively) assisted Mr L with moving some digging equipment to the back garage door.

14. [redacted] recalled that he observed the Coonara heater to be burning normally in the garage. Mr L's neighbour, Mr P also attended the property that afternoon and recalled that the Coonara heater was on at the time.

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[2] Subject to the principles enunciated in *Briginshaw v Briginshaw* (1938) 60 CLR 336. The effect of this and similar authorities is that coroners should not make adverse findings against, or comments about, individuals unless the evidence provides a comfortable level of satisfaction as to those matters taking into account the consequences of such findings or comments.

[3] Statement of Ms S, dated 19 June 2020, p 23-24 of coronial brief (**CB**); SC Wilkins provided the Court with an example video that explains one method for how modification can occur. It is unknown which video Mr L used as a tutorial. However, given the multiple descriptions of Mr L as a talented handyman, it appears likely that he would have had little difficulty in performing a similar modification to his Coonara heater.

[4] Statement of [redacted], dated 29 July 2020, p 20 of CB.

15. Mr L and Ms S entertained friends that evening in the garage from approximately 6.30pm until midnight. The Coonara heater was burning for this entire time. Mr L and Ms S went to bed sometime after midnight.

16. Between 2.30am and 2.40am on 23 May 2020, Mr P was at home in his adjoining property when he heard a *few pops* and observed Mr L's and Ms S's garage to be on fire. Mr P and his family ran over to their front door to alert the family. Ms S answered the door and called out for Mr L, but he did not respond.

17. Ms S saw that the rear glass sliding door was open. She then heard a *loud explosion* and witnessed Mr L being thrown back from the garage. Mr L was engulfed in flames, and he told Ms S to get their children out of the house. Several witnesses recalled that Mr L crawled around to the front of the house and that he appeared to have suffered from severe burns.

18. At approximately 2.45am, Victoria Police arrived at the [redacted] address having noticed the fire whilst attending other duties nearby. The house was fully engulfed in flames at this time. Attending police provided Mr L with immediate first aid. Mr L was conscious at this time and complained of severe pain. He was placed on a stretcher and moved across the street away from the heat of the fire.

19. The CFA arrived on scene at 2.52am and Ambulance Victoria paramedics at 2.57am. The fire was brought under control by 3.16am. Mr L was conveyed by ambulance at 4.01am to the Alfred Hospital, where he arrived at 4.41am.

20. Upon arriving in the emergency department, Mr L was found to have suffered burns to 95% of his body. He was admitted to the Intensive Care Unit where it was established that his injuries were *unsurvivable*. A decision was made for palliative care, and Mr L sadly passed away at approximately 8.05pm 23 May 2020.

21. Mr L's family kindly consented to the donation of his tissue and organs.

Identity of the deceased

22. On 23 May 2020, Mr L, born [redacted] 1984, was visually identified by his father, [redacted].

23. Identity is not in dispute and requires no further investigation.

Medical cause of death

24. Specialist Forensic Pathologist, Dr Heinrich Bouwer from the Victorian Institute of Forensic Medicine, conducted an autopsy on 28 May 2020 and provided a written report of his findings dated 30 October 2020.

25. Toxicological analysis of post-mortem samples identified the presence of:

    i. Ethanol (Plasma) - ~0.14g/100mL;[5]
    ii. Morphine (Plasma) - ~0.09 mg/L;[6]
    iii. Midazolam (Plasma) - ~0.2 mg/L;[7]
    iv. Laudanosine (Plasma) - ~0.03 mg/L;[8]
    v. Ketamine (Plasma) – Detected;[9]
    vi. Toluene (Plasma) – Detected;[10] and
    vii. m-Xylene (Plasma) - Detected[11]

26. Dr Bouwer provided an opinion that the medical cause of death was *Thermal Injuries Sustained in a Fire*.

27. I accept Dr Bouwer's opinion as to the medical cause of death.

FURTHER INVESTIGATIONS

28. A comprehensive joint investigation of the [redacted] address was undertaken by investigators from the VPFSC, CFA, and Victoria Police Arson and Explosives Squad to determine the cause of the fire.

<u>VPFSC investigation</u>

29. Forensic Officer George Xydias (**FO Xydias**) from the Fire and Explosion Unit of the VPFSC examined the house and garage. The [redacted] address was noted to be a single storey, four-bedroom dwelling with a semi-detached garage on the south-eastern corner.

[5] Ethanol is a social drug that is consumed as a beverage.
[6] Morphine is an opioid that is medically used for the treatment of moderate to severe pain.
[7] Midazolam is a preoperative medication.
[8] Laudanosine is general anaesthesia that is used to aid tracheal intubation, muscle relaxation for surgery, and mechanical ventilation
[9] Ketamine is an anaesthetic often used for short and medium duration operations.
[10] Toulene is an octane booster used in gasoline fuels for internal combustion engines.
[11] m-Xylene is the methylated form of Xylene, which is present in gasoline fuels and is a commonly used solvent.

Initial observations

30. FO Xydias immediately observed that the fire had originated in the garage, as this portion of the property was the most severely damaged.[12] He further observed that damage to the rest of the house indicated a spread from the garage into the rest of the house via the roof space that had connected the garage to the house.

31. The roof of the entire property was intensely fire affected – particularly the garage roof. Much of the timber frame had been consumed and there was a layer of roof tiles covering the floor of the garage.[13]

32. FO Xydias observed that the garage's rear roller door that Mr L had reportedly opened immediately prior to receiving his injuries was *seized at a position more than half way up the door frame*.[14] FO Xydias also observed that the Coonara heater's front door was closed and the latch was in the locked position.

Cause of the fire

33. FO Xydias noted that the flue[15] of the heater was only partially insulated.[16] The flue that ran from the top vent of the heater to the garage ceiling was uninsulated (single skin). The portion that ran through the ceiling, and thus in closest proximity to items stored in the roof, was insulated (double skin).[17]

34. FO Xydias concluded that the most probable point of origin of the fire to be somewhere in the vicinity of the Coonara heater.[18] FO Xydias provided the following as potential localised available combustible material:[19]

    i. The various timber framed cabinetry/shelves, the wall/ceiling timbers, and other fixtures/contents, beside or above the heater;[20]

[12] Statement of George Xydias, dated 1 July 2020, p 102 of CB.
[13] Statement of FO Xydias, as above, p 103 of CB.
[14] Statement of FO Xydias, as above, p 102 of CB.
[15] A flue is pipe or other duct that directs smoke and other gases away from a fire. In this case, the flue extended vertically from the body of the heater and directed the smoke and gases outdoors through the roof.
[16] Statement of FO Xydias, as above, p 102 of CB.
[17] Statement of FO Xydias, as above, p 102-103 of CB.
[18] Statement of FO Xydias, as above, p 104 of CB.
[19] Ibid.
[20] FO Xydias noted that there were timber cupboards and/or shelving situated close to the Coonara heater, with a gap of approximately 15cm between either side of the heater and the respective edges of the flanking timber cabinetry/shelves.

ii. Any plastic, cardboard, or other combustible items on the floor or vicinity of the heater;

iii. The large number of combustible objects stored in the roof space above the garage and/or lounge room; and

iv. Combustible oils, liquids and/or other times used to fuel the heater.

Source of ignition

35. Due to the extent of the fire damage to all combustible fittings and contents within the garage, investigators could only provide a generalised area in which the fire originated which was on the western side of the garage where the Coonara was situated.[21] This also included the flue and its penetration through the ceiling into the roof cavity.

36. The source of ignition could not be determined given the significant damage to the garage, but FO Xydias provided the following as potential sources of ignition:[22]

i. Spillage of oil when filling or leaking of the piping onto the hot surface of the heater could initiate a fire;

ii. Ignition of the stored materials in the roof space above the garage, specifically near the heater flue. The use of unshielded, single-skinned metal flues is hazardous and not advised, as the conducted heat would be sufficient to ignite most structural or stored materials; and

iii. The proximity of the heater to the adjoining timber cabinets/shelves and/or items in front of the heater. Radiated or conducted heat could initiate combustible items in proximity.

37. It was also considered a possibility that the fire started as a result of a discarded or dropped cigarette butt, match, or similar smoking related item. This is dependent upon whether individuals had recently smoked in the garage, which FO Xydias considered a possibility given the presence of cigarette butts in the rear yard.[23]

[21] Statement of FO Xydias, as above, p 105 of CB.
[22] Ibid.
[23] Ibid; Ms S also noted in her statement that smoking had occurred in the garage on 22 May 2020. During the search of the property, both investigators observed evidence of *very heavy smoking activity* in the rear outside decking area. Direct ignition by a match or a cigarette lighter was also raised as a possibility, although there was no evidence to substantiate this scenario.

Conclusions

38. FO Xydias surmised that a so-called *flashover* event may have occurred, caused by the venting of flammable gas into the garage as the bottles and cylinders were *intensely heat affected*. When Mr L opened the rear roller door, a *large volume of air* would have entered the garage, thus facilitating a minor explosion.[24] The sound of which was heard by multiple witnesses.

39. FO Xydias did not observe any indication of the presence of flammable liquid in either the garage or the rest of the property for the purpose of initiating, spreading, or fuelling the fire.[25] The observed burning characteristics in the vicinity of the various fixtures and contents across the garage were suggestive of a *prolonged available materials fuelled fire*.[26]

40. FO Xydias did not identify any suspicious circumstances or evidence of third party involvement as a result of their investigation.

CFA investigation

41. Fire Investigator Kevin Berry (**FI Berry**) conducted his investigation in conjunction with FO Xydias.[27] His observations and conclusions were consistent with that of FO Xydias.

42. FI Berry observed that there was damage to the pipes that connected the heater to the oil reservoir. However, given the state of the garage, it was not possible to determine if this damage had occurred before or after the fire.[28]

43. FI Berry recorded the fire as having an *overall undetermined causation*.[29] He suggested several possible causes, which are the same as those expressed by FO Xydias in his report.

Additional investigations by SC Wilkins

44. SC Wilkins conducted further inquiries at my request to confirm whether:

[24] Statement of FO Xydias, as above, p 103.
[25] Statement of FO Xydias, as above, p 103-104 of CB.
[26] Ibid; FO Xydias observed that the garage appeared to have only been used as a workshop and for storage purposes, with no provision to house any vehicle or other large objects. Furthermore, the interior appeared to have been quite heavily congested prior to the fire. This was exacerbated by what appeared to be evidence of contents that had fallen from the roof space. It was reported by family that Mr L used the roof space of the garage for storage of various items, such as toys, clothing, and camping gear. The garage also contained numerous gas cylinders and bottles.
[27] CFA Fire Investigation Report, dated 29 June 2020, p 124 of CB.
[28] CFA Fire Investigation Report, dated 29 June 2020, p 126 of CB.
[29] CFA Fire Investigation Report, dated 29 June 2020, p 127 of CB.

- there was a smoke detector installed in the garage at the time of the incident; and
- the Coonara heater was left burning when Mr L and his family went to bed on the evening of 22 May 2020.

45. Ms S advised SC Wilkins that there was no smoke detector in the garage and that, although she could not exactly recall, she believed that Mr L *would have turned it off* as *he usually would*.

46. SC Wilkins also spoke to a neighbour, [redacted] who was a guest of Mr L and Ms S on the night of the accident and was the last guest to leave that evening. [redacted] stated that at that time, Mr L was still in the garage when he left and that the Coonara was on.

CPU REVIEW OF COONARA-STYLE HEATER FIRES

47. I requested that the Coroners Prevention Unit (**CPU**) conduct a review into the number of deaths that have occurred where a Coonara-style wood heater (or a similar style of heater that had been converted to run on waste oil) was a possible cause of fire.[30]

48. I also requested CPU to identify any prevention opportunities linked to such deaths, including issues such as heater conversions, the use of single flues on heaters, and the dangers related to storage of flammable items around heaters.

CPU investigation

49. The CPU identified ten deaths (including Mr L's) between 1 February 2012 and 30 November 2021 that involved a similar type of heater to the Coonara-style wood heater that had been installed in Mr L's garage. This case was however the only death that appeared to involve a Coonara heater that had been converted to run on waste oil.

50. From the cases identified, four of the deaths, including Mr L's, involved the heater flue as being the potential or likely source for the fatal fire.

Previous Recommendations

[30] The Coroners Prevention Unit (**CPU**) was established in 2008 to strengthen the prevention role of the coroner. The unit assists the Coroner with research in matters related to public health and safety and in relation to the formulation of prevention recommendations. The CPU also reviews medical care and treatment in cases referred by the coroner. The CPU is comprised of health professionals with training in a range of areas including medicine, nursing, public health and mental health. The CPU may also review the medical care and treatment in cases referred by the coroner as well as assist with research into public health and safety.

51. The CPU also identified previous coronial recommendations arising from the investigation into the deaths of [redacted] and [redacted] undertaken by Coroner Klestadt.[31] This case examined the deaths of two young children in a house fire, involving a Coonara-style wood heater. The recommendations made highlighted the importance of regular heater and flue maintenance in households where a wood heater is installed.

52. In that case (similar to Mr L's matter), the cause of the fire was believed to have been a single flue that passed through a pre-existing chimney which was connected to a Coonara-style wood heater. The chimney had accumulated various detritus – such as leaves and bird nesting –which had come into contact or close proximity to the flue and subsequently ignited a fire that then destroyed the property.

53. Following contemporaneous advice from the CPU who had consulted with the Victorian Building Authority (**VBA**), VPFSC, a building surveyor, and a Metropolitan Fire Brigade Investigator about the circumstances of the case, Coroner Klestadt made the following recommendations:

    a) That the VBA produce a consumer information brochure on the importance of regular heater and flue maintenance for households where a wood heater is installed. The brochure should offer specific advice on the importance of checking chimney spaces around flues for detritus that might accumulate and cause a fire hazard.
    b) That the VBA produce a practice note offering detailed guidance to plumbers on appropriate installation and maintenance of wood heaters and associated flue systems. The practice note should offer specific guidance on processes such as inspecting chimneys to ensure they are appropriate for fitting single skin flues and checking whether detritus is accumulating around a flue installed in an existing chimney.

54. The VBA accepted Coroner Klestadt's recommendations in full and they were implemented in the weeks that followed the completion of the finding to create awareness before the winter season.

55. The implementation consisted of the introduction by VBA of a consumer brochure reminding people of the need to engage a plumbing practitioner licensed or registered in mechanical services for periodic maintenance of their solid fuel heaters, and also warning of the dangers posed by the build-up of detritus around a heater. The VBA, along with Energy Safe Victoria,

[31] Coroner Klestadt, CCOV Court References COR 2021 1074 and COR 2012 1075, respectively.

continues to recommend that solid fuel heaters should be serviced and checked by a licenced and registered plumber every 12 months.[32]

CPU conclusion

56. The CPU was unable to identify any prevention opportunities which had not already been identified in relation to Mr L's death, noting that:

- investigators were unable to identify a clear ignition source for the fire; and
- the VBA had already provided advice to consumers on the need for regular servicing and checking of solid fuel heaters by a professional.

FINDINGS AND CONCLUSION

57. Pursuant to section 67(1) of the Act I make the following findings:

a) the identity of the deceased was Mr L, born [redacted] 1984;

b) the death occurred on 23 May 2020 at The Alfred Hospital, 55 Commercial Road, Melbourne, Victoria, from *Thermal Injuries Sustained in a Fire*; and

c) the death occurred in the circumstances described above.

58. Although Mr L's heater was fuelled by oil rather than wood, the available evidence suggests that the most likely cause of the fire was the uninsulated portion of the flue coming into proximity or direct contact with nearby material.

59. I accept the CPU's advice that the VBA's responses to the recommendations are sufficient to create awareness of the potential dangers of single skin flues as well as the necessity for annual servicing by professionals.

60. I convey my sincere condolences to Mr L's family for their loss and acknowledge the sudden and tragic circumstances in which his death occurred.

61. Pursuant to section 73(1B) of the Act, I order that this finding be published (in redacted form) on the Coroners Court of Victoria website in accordance with the rules.

[32] Just one example of these recommendations is found in a Victorian Building Authority Media Release dated 9 May 2017, available via their website at https://www.vba.vic.gov.au/__data/assets/pdf_file/0003/56442/170509-VBA-Check-your-heaters.pdf.

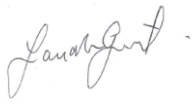
62. I direct that a copy of this finding be provided to the following:

Ms S, Senior Next of Kin

Victorian Building Authority

Senior Constable Mathew Wilkins, Coroner's Investigator

Signature:



Coroner Sarah Gebert

Date : 30 December 2022

NOTE: Under section 83 of the ***Coroners Act 2008*** ('the Act'), a person with sufficient interest in an investigation may appeal to the Trial Division of the Supreme Court against the findings of a coroner in respect of a death after an investigation. An appeal must be made within 6 months after the day on which the determination is made, unless the Supreme Court grants leave to appeal out of time under section 86 of the Act.